

## Universal Properties of Polymers in Liquid Solvents and Supercritical Fluids

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We present small-angle neutron scattering measurements of the radius of gyration ( $R_g$ ), the susceptibility  $\chi$  and the correlation length of the concentration fluctuations  $\xi$  as a function of temperature and pressure in solutions of poly(dimethyl siloxane) in supercritical carbon dioxide and in liquid organic solvent bromobenzene. In both cases, the deterioration of the solvent quality leads to divergence of  $\xi$  and  $\chi$  which is described by the Ising model exponents. At the same time,  $R_g$  remains invariant during both temperature and pressure quenches which extend from the  $\Theta$  condition to the immediate vicinity of the polymer-liquid or polymer- supercritical fluid demixing locus. The results demonstrate that the supercritical polymer solutions reproduce all salient features of the structure and phase behavior of polymers in liquid solvents and exhibit novel effects, such as a pressure-induced transition to the  $\Theta$  point and to the good solvent domain.

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